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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

 Applicant claims small entity status. See 37 CFR 1.27TOTAL AMOUNT OF PAYMENT (\$)
330.00

Complete if Known

Application Number	09/858,280
Filing Date	MAY 16, 2001
First Named Inventor	RALPH C. GRAY
Examiner Name	ROBERT E. SELLERS
Art Unit	1712
Attorney Docket No.	PPG - 1656A1

METHOD OF PAYMENT (check all that apply)

 Check Credit card Money Order Other None
 Deposit Account:Deposit Account Number
Deposit Account Name

502800

BLK LAW GROUP

The Director is authorized to: (check all that apply)

 Charge fee(s) indicated below Credit any overpayments
 Charge any additional fee(s) or any underpayment of fee(s)
 Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity	Small Entity	Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385			Utility filing fee	
1002 340	2002 170			Design filing fee	
1003 530	2003 265			Plant filing fee	
1004 770	2004 385			Reissue filing fee	
1005 160	2005 80			Provisional filing fee	
SUBTOTAL (1) (\$)					

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Independent Claims	Multiple Dependent	Extra Claims	Fee from below	Fee Paid
			-20** =	X	=
			-3** =	X	=

Large Entity	Small Entity	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent
SUBTOTAL (2) (\$)		

**or number previously paid, if greater; For Reissues, see above

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	
Other fee (specify) _____			
*Reduced by Basic Filing Fee Paid			
SUBTOTAL (3) (\$)			330

(Complete if applicable)

Name (Print/Type)	KRISANNE SHIDELER	Registration No. (Attorney/Agent)	36,272	Telephone	724-934-5450
Signature				Date	DECEMBER 22, 2003

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This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Confirmation No. 2673
Ralph C. Gray et al. : PATENT APPLICATION
Serial No. 09/858,280 : Group Art Unit: 1712
Filed: May 16, 2001 : Examiner: R. Sellers
For: CURABLE, WELDABLE : Atty. Docket No. 1656A1
COATING COMPOSITIONS :
:

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in support of the Notice of Appeal filed October 21, 2003, appealing the final rejection of claims 1-10, 13 and 14. The Commissioner is hereby authorized to charge deposit account 502800 for any and all fees necessary for filing this brief. The following headings correspond to the requirements of 37 CFR §1.192(c).

12/30/2003 NDANTE1 00000040 502800 09858280

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1415, on <u>December 22, 2003</u>
(Date of Deposit and Signature)
Krisanne Shideler

(Signature)

(1) REAL PARTY IN INTEREST

The real party in interest is PPG Industries Ohio, Inc. having offices at 3800 West 143 Street, Cleveland, Ohio 44111, a wholly-owned subsidiary of PPG Industries, Inc. having offices at One PPG Place, Pittsburgh, Pennsylvania 15272.

(2) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellants, the appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board of Appeals ("Board")'s decision in the pending appeal.

(3) STATUS OF CLAIMS

Claims 1-10, 13 and 14 are all the claims pending in the application, and all are rejected. Claims 11, 12, and 15-28 have been cancelled. Claims 1-10, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berger et al., U.S. Patent No. 6,440,580 B1 (hereinafter also referred to as "Berger") and Young, Jr. et al., U. S. Patent No. 4,346,143 (hereinafter also referred to as "Young"), in view of Japanese Patent No. 7-331164 (hereinafter also referred to as "the Japanese reference"). Claims 1-10, 13 and 14 are on appeal.

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A Final Rejection in the above application was mailed September 16, 2003; claims 1-10, 13 and 14, all the claims currently pending in the application, were rejected. Claims 15-28 were withdrawn from consideration; claims 16-28 were withdrawn as being drawn to non-elected inventions, and claim 15 was withdrawn as being directed to the non-elected species of a composition with corrosion resistant pigments. Claims 1-10, 13 and 14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Berger and Young in view of the Japanese reference.

An Amendment After Final Action (hereinafter "Amendment") was timely filed. The Amendment cancelled claims 15-28 to place the claims in better

condition for appeal. Applicants expressly reserved the right to file a divisional patent application on the subject matter of claims 15-28. The Amendment was entered but the rejection of claims 1-10, 13 and 14 under 35 U.S.C. §103(a) was maintained. In an earlier Amendment dated June 18, 2003, and later resubmitted on July 9, 2003, claims 11 and 12 were cancelled. However, The Examiner apparently overlooked the cancellation of claims 11 and 12 and erroneously indicated in subsequent communications that claims 1-14 were pending in the application.

(5) SUMMARY OF THE INVENTION

The present invention provides a curable coating composition comprising two components: (a) a resinous binder and (b) an electroconductive pigment. The resinous binder in turn comprises two components: (i) a reaction product of an epoxy-containing polymer with a compound containing phosphorus acid groups and (ii) a curing agent (page 5, lines 19-20; page 8, lines 11-12; claim 1). The reaction product (i) is present in the curable coating composition in amounts of 50 to 90 percent by weight of the resinous binder (a) (claim 1). In one embodiment of the present invention, the epoxy-containing polymer used to make the reaction product (i) is a polyglycidyl ether of a polyhydric phenol (claim 2; page 5, lines 22-27). In a particular embodiment, the polyhydric phenol used to prepare the epoxy-containing polymer is Bisphenol A (claim 3; page 6, line 8). The compound containing phosphorus acid groups used to make the reaction product (i) may be selected from phosphonic acids, phosphorous acids, phosphoric acids, including super- and poly-, and mixtures thereof (claim 5; page 7, lines 3-26). The reaction product (i) has reactive functional groups on it that allow the reaction product to cure with the curing agent (page 8, lines 6-10; claim 1). The reaction product (i) has reactive functional groups such as hydroxyl groups, including acidic hydroxyls, or hydroxyl groups and epoxy groups, depending on the equivalent ratio of the compound containing phosphorus acid groups to the epoxy-containing polymer used to prepare the reaction product (claim 7; page 8, lines 6-10). In one embodiment of the invention the equivalent ratio of the compound containing

phosphorus acid groups to epoxy-containing polymer is within the range of 0.5 to 3.5:1 (page 8, lines 1-3; claim 6). In one embodiment of the present invention the molecular weight of the epoxy-containing polymer is 220 to 4500 (claim 4).

The curing agent (ii) is present in the curable coating composition in amounts of 10 to 50 percent by weight of the resinous binder (a) (page 10, lines 26-27; claim 1). In one embodiment of the present invention, the curing agent is selected from aminoplast resins, polyisocyanates, polyacids, organometallic complexed materials, polyamines, and polyamides depending on the identity of the functional groups in the reaction product (page 8, lines 13-17; claim 8). It is most often an aminoplast (claim 9), also commonly called "melamine" because melamine is very often used to prepare aminoplasts. Aminoplasts can be obtained from the condensation reaction of an aldehyde such as formaldehyde with an amine or amide. Nonlimiting examples of amines or amides include melamine, urea and benzoguanamine (page 8, lines 19-20).

In one embodiment of the present invention, the weight percent of the resinous binder (a) in the coating composition, based on the total weight of (a) plus (b), is from 10 to 55 percent (claim 13). The weight percent of the electroconductive pigment (b) in the coating composition, based on the total weight of (a) plus (b), may be from 45 to 90 percent (page 11, lines 11-13; claim 14). The electroconductive pigment (b) is dispersed in the resinous binder (a) such that the weight ratio of the pigment (b) to the resinous binder (a) is within the range of 0.5 to 9.0:1 (page 11, lines 9-11; claim 1). Additionally, when the curable coating composition of the present invention is deposited and cured on a metal substrate, the cured coating is weldable (claim 1; page 11, lines 5-7). By "weldable" is meant that the cured coating is sufficiently electroconductive to sustain a spot welding and joining operation as used in an automotive assembly plant (page 11, lines 7-9).

The electroconductive pigment in the coating composition of the present invention allows the cured coating to be weldable. In one embodiment of the present invention, the electroconductive pigment is selected from zinc,

aluminum, iron, graphite, diiron phosphide, tungsten, stainless steel, and mixtures thereof (claim 10).

The weldable coating compositions of the present invention, which contain phosphorus modified epoxy resins (the reaction product of (i)), demonstrate improved adhesion to substrates compared to weldable coating compositions that contain conventional epoxy resins such as polyglycidyl ethers of polyhydric phenols. Table 1 on pages 25 and 26 in the specification shows a comparison of coating compositions of the present invention compared to coating compositions containing conventional epoxy resins (such as Bonazinc® 3000, a zinc-rich epoxy resin-containing coating, also disclosed in Berger; and Bonazinc® 3001, both of which contain conventional epoxy resins). Note that coating compositions prepared in accordance with the present invention; i. e., containing phosphorus-modified epoxy resins, (Examples 1-5, rows 5-11 of Table 1) demonstrate markedly improved adhesion compared to conventional coating compositions Bonazinc® 3000 and Bonazinc® 3001, without the need for pretreatment (see rows 2 and 4 of Table 1, where the conventional coatings are compared directly to the compositions of the present invention). The presence of phosphorus modified epoxy resins in the curable coating compositions of the present invention is critical to the adhesion (Table 1) and corrosion resistance performance (Table 2) of the invention. The examples further demonstrate the use of phosphorus modified epoxy resins within the claimed ranges of 50 to 90 percent by weight of the resinous binder.

(6) ISSUES

- (i) No issues relating to 35 U.S.C. §112, first paragraph.
- (ii) No issues relating to 35 U.S.C. §112, second paragraph.
- (iii) No issues relating to 35 U.S.C. §102.

(iv) Whether claims 1-10, 13 and 14 are unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference.

(7) GROUPING OF CLAIMS

(i) No issues.

(ii) No issues.

(iii) No issues.

(iv) As to Issue iv, whether claims 1-10, 13 and 14 are unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference, claims 1-10, 13 and 14 stand or fall together.

(8) ARGUMENT

(i) No issue.

(ii) No issue.

(iii) No issue.

(iv) Issue iv, whether claims 1-10, 13 and 14 are unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference.

Claims 1-10, 13 and 14 are rejected as being unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference. The Office Action dated March 18, 2003, alleges that Berger discloses a weldable coating composition comprising an epoxy-containing material (col. 9, lines 24-26) such as a diglycidyl ether of Bisphenol A (col. 4, lines 10-18) in combination with aminoplasts or isocyanates as curing agents (col. 9, lines 27-28 and 49-58) and electroconductive pigments such as diiron phosphide (col. 8, lines 64-66). The Office Action further alleges that Young discloses a weldable

(col.5, lines 63-64), electroconductive primer coating (col. 7, lines 38-39) comprising an epoxy-containing material (col. 5, lines 8-12) such as Bisphenol A-advanced diglycidyl ethers of Bisphenol A (cols. 15-16, Table IV), a Resimene® or Cymel® aminoplast curing agent (col. 5, lines 45-58 and Table IV) and an electroconductive pigment such as zinc or iron phosphides (col. 6, line 24). The Final Office Action dated July 22, 2003, alleges that Young shows a weldable coating containing from 60-90 weight percent of an epoxy resin and from 10-40 weight percent of a curing agent, indicating that it would have been obvious to employ the epoxy-containing material of Berger within the exemplified amount of from 60-90 percent of Young in order to enhance the adhesion of the coating imparted by the epoxy-containing material.

The Office Actions concede that neither Berger nor Young recite the claimed reaction product of the epoxy resin with a phosphorus acid groups-containing compound (hereinafter also referred to as "phosphorus modified epoxy"). The Final Office Action asserts that the motivation and reasonable expectation of success rests with the Japanese reference, which ascribes "good storage stability and coatability, and forms good coating films with good adhesion, water resistance and fabrication properties" (abstract, Advantage section) to its own disclosed component P1 which includes the phosphorus modified epoxy. The Office Action dated March 18, 2003, alleges that the Japanese reference teaches an epoxy resin modified with phosphoric acid, a curing agent, and a pigment used as a coating for steel plates which are subsequently fabricated into articles, and concludes by alleging that it would have been obvious to one of ordinary skill in the art to modify the epoxy-containing materials of Berger and Young via reaction with the phosphoric acid of the Japanese reference in order to improve storage stability, adhesion, water resistance and fabrication properties.

Appellants respectfully submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). First, if the references are considered each in their entirety, there is no motivation to combine the teachings of the Japanese reference with Berger and Young. Secondly, and more significantly, if one were to combine the whole teachings

of Berger and Young with the whole teaching of the Japanese reference, one would not arrive at the present invention as claimed.

References Considered as a Whole Offer No Motivation To Combine

The motivation to modify the prior art must flow from some teaching in the art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention. See *In re Napier*, 55 F.3d 610, 613, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). Berger and Young disclose weldable coating compositions that may contain epoxy functional resins and aminoplast (melamine) curing agents (Young col. 5, lines 18-62; Berger col. 9, lines 20-58). The epoxy functional resins taught by both references are conventional diglycidyl ethers of polyhydric alcohols. Young demonstrates in Table IV that these conventional epoxy resins may be used in an amount of 60-90 percent by weight, and a curing agent may be used in an amount of 10-40 percent by weight. The Japanese reference discloses a composition prepared by blending a reaction product of an epoxy resin *with phosphoric acid*, a polyester resin containing hydroxyl groups, and an aminoplast (melamine) resin for use as an undercoat for a precoated metal (abstract). First, there is no teaching or suggestion in the Japanese reference that the phosphorus modified epoxy functional resins used therein are suitable for use in weldable coatings. The pigments disclosed in the Japanese reference are conventional, non-electroconductive pigments. Further, it is stated in paragraph [0015] of the Japanese reference: "No specific limitation is placed on the compounding ratio of the modified epoxy resin (A), polyester resin (B) containing hydroxyl groups, and curing agent (C). However, *from the standpoint of adhesive properties and moisture resistance*, the content ratio of the modified epoxy resin (A) is preferably 0.1-20 wt % . . ." (emphasis added). The Office Action alleges that the motivation to modify the epoxy-containing materials of Berger and Young via reaction with the phosphoric acid of the Japanese reference is in order to improve storage stability, adhesion, water resistance and fabrication properties. However, this proposed motivation to

modify the Berger and Young references with the teaching of the Japanese reference to use phosphorus modified epoxy resins is invalid because one skilled in the art would not be led to use the phosphorus modified epoxy resin of the Japanese reference at levels as high as those disclosed by Young in order to improve adhesion or moisture resistance. The Japanese reference explicitly recommends using a phosphorus modified epoxy resin at levels between 0.1 and 20 percent by weight in order to maintain adhesive properties and moisture resistance.

There is absolutely no motivation to modify the compositions of Berger and Young by using the phosphorus modified epoxy resin of the Japanese reference at the epoxy levels taught by Young, which are at least three times the levels disclosed by the Japanese reference for optimum adhesion and moisture resistance of a phosphorus modified epoxy resin. One skilled in the art would not be motivated to improve storage stability, adhesion, water resistance and fabrication properties of the Berger and Young compositions by using the phosphorus modified epoxy of the Japanese reference at the levels taught by Young.

References Considered as a Whole Teach Away from Invention

If one were to combine the whole teachings of Berger and Young with the whole teaching of the Japanese reference, one would not arrive at the present invention as claimed; i. e., a curable coating composition comprising:

- (a) a resinous binder comprising:
 - (i) a reaction product of an epoxy-containing polymer with a compound containing phosphorus acid groups, the reaction product being present in the composition in amounts of 50 to 90 percent by weight of the resinous binder and having reactive functional groups, and
 - (ii) a curing agent having functional groups reactive with the functional groups of (i), the curing agent being present in the composition in amounts of 10 to 50 percent by weight of the resinous binder; and
- (b) an electroconductive pigment dispersed in (a) such that the weight ratio of b to (i) plus (ii) is within the range of 0.5 to 9.0:1, the curable coating

composition being characterized such that when it is deposited and cured on a metal substrate, the cured coating is weldable.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). See also MPEP §2141.02: "[a] prior art reference must be considered in its entirety, i. e., as a whole, including portions that would lead away from the claimed invention." If the references are considered each in their entirety, the teachings of the Japanese reference combined with Berger and Young teach away from the present invention. As mentioned earlier, Berger and Young disclose weldable coating compositions that may contain conventional epoxy functional resins and aminoplast (melamine) curing agents. Young demonstrates in Table IV that the conventional epoxy resin may be used in an amount of 60-90 percent by weight, and a curing agent may be used in an amount of 10-40 percent by weight. The Japanese reference discloses other coating compositions prepared by blending a reaction product of an epoxy resin with phosphoric acid, a polyester resin containing hydroxyl groups, and an aminoplast (melamine) resin for use as an undercoat for a precoated metal. The Japanese reference indicates that the phosphorus modified epoxy resin is preferably used in an amount of 0.1 to 20 percent by weight when considering adhesive properties and moisture resistance. No other quantitative range is disclosed by the Japanese reference. While the range of 60-90 percent by weight is taught by Young to be suitable for a conventional epoxy resin in a weldable coating composition, there is no teaching or suggestion in any of the references, taken alone or in any combination, that such a high range is suitable for a phosphorus modified epoxy resin in a weldable coating or any other coating. If one were to combine all the references after considering them in their entirety, in order to prepare a weldable coating composition comprising a phosphorus modified epoxy resin and a curing agent, one skilled in the art would be compelled to use the phosphorus modified epoxy resin taught by the

Japanese reference at the low levels taught by the Japanese reference, in order to avoid the risk of compromised adhesion or moisture resistance. The Japanese reference explicitly teaches the use of phosphorus modified epoxy resins at levels of 0.1 to 20 percent by weight in order to maintain adhesion and moisture resistance properties.

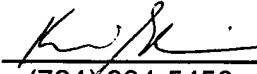
CONCLUSION

Appellants have shown that if the references are considered each in their entirety, there is no motivation to combine the teachings of the Japanese reference with Berger and Young in order to arrive at the present invention. Appellants have further shown that if one were to combine the whole teachings of Berger and Young with the whole teaching of the Japanese reference, one would not arrive at the present invention as claimed.

Based on the above, Appellants respectfully request that the Board reverse the Examiner on the rejection of claims 1-10, 13 and 14 as unpatentable under 35 U.S.C. 103(a) over Berger and Young in view of the Japanese reference and allow claims 1-10, 13 and 14.

Respectfully submitted,

KRISANNE SHIDELER
Registration No. 36,272
Agent of Record



(724) 934-5450

Pittsburgh, Pennsylvania
December 22, 2003

Appendix
THE CLAIMS ON APPEAL

1. (Once amended) A curable coating composition comprising
 - a. a resinous binder comprising:
 - i. a reaction product of an epoxy-containing polymer with a compound containing phosphorus acid groups, the reaction product being present in the composition in amounts of 50 to 90 percent by weight of the resinous binder and having reactive functional groups, and
 - ii. a curing agent having functional groups reactive with the functional groups of (i), the curing agent being present in the composition in amounts of 10 to 50 percent by weight of the resinous binder; and
 - b. an electroconductive pigment dispersed in (a) such that the weight ratio of b to (i) plus (ii) is within the range of 0.5 to 9.0:1,

the curable coating composition being characterized such that when it is deposited and cured on a metal substrate, the cured coating is weldable.

2. (Original) The curable coating composition according to claim 1 in which the epoxy-containing polymer is a polyglycidyl ether of a polyhydric phenol.

3. (Original) The curable coating composition according to claim 2 where the polyhydric phenol is Bisphenol A.

4. (Original) The curable coating composition according to claim 1 wherein the molecular weight of the epoxy-containing polymer is 220-4500 based on epoxy equivalent multiplied by the epoxy functionality.

5. (Original) The curable coating composition according to claim 1 wherein the compound containing phosphorus acid groups is selected from the group comprising phosphoric acid, a phosphonic acid, and phosphorous acid.

6. (Original) The curable coating composition according to claim 1 wherein the equivalent ratio of the compound containing phosphorus acid groups to epoxy-containing polymer is within the range of 0.5 to 3.5:1.

7. (Original) The curable coating composition according to claim 1 wherein the functional groups of (i) are hydroxyl groups or hydroxyl and epoxy groups.

8. (Original) The curable coating composition according to claim 1 wherein the curing agent is selected from the group comprising aminoplast resins, polyisocyanates, polyacids, organometallic complexed materials, polyamines, and polyamides.

9. (Original) The curable coating composition according to claim 8 wherein the curing agent is an aminoplast.

10. (Original) The curable coating composition according to claim 1 wherein said electroconductive pigment is selected from the group comprising zinc, aluminum, iron, graphite, diiron phosphide, tungsten, stainless steel, and mixtures thereof.

13. (Original) The curable coating composition according to claim 1 wherein the weight percent of (a) based on the total weight of (a) plus (b) is from 10 to 55 percent.

14. (Original) The curable coating composition according to claim 1 wherein the weight percent of (b) based on the total weight of (a) plus (b) is from 45 to 90 percent.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

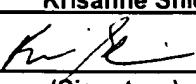
In re Application of : Confirmation No. 2673
Ralph C. Gray et al. : PATENT APPLICATION
Serial No. 09/858,280 : Group Art Unit: 1712
Filed: May 16, 2001 : Examiner: R. Sellers
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Krisanne Shideler	
	
(Signature)	

(1) REAL PARTY IN INTEREST

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condition for appeal. Applicants expressly reserved the right to file a divisional patent application on the subject matter of claims 15-28. The Amendment was entered but the rejection of claims 1-10, 13 and 14 under 35 U.S.C. §103(a) was maintained. In an earlier Amendment dated June 18, 2003, and later resubmitted on July 9, 2003, claims 11 and 12 were cancelled. However, The Examiner apparently overlooked the cancellation of claims 11 and 12 and erroneously indicated in subsequent communications that claims 1-14 were pending in the application.

(5) SUMMARY OF THE INVENTION

The present invention provides a curable coating composition comprising two components: (a) a resinous binder and (b) an electroconductive pigment. The resinous binder in turn comprises two components: (i) a reaction product of an epoxy-containing polymer with a compound containing phosphorus acid groups and (ii) a curing agent (page 5, lines 19-20; page 8, lines 11-12; claim 1). The reaction product (i) is present in the curable coating composition in amounts of 50 to 90 percent by weight of the resinous binder (a) (claim 1). In one embodiment of the present invention, the epoxy-containing polymer used to make the reaction product (i) is a polyglycidyl ether of a polyhydric phenol (claim 2; page 5, lines 22-27). In a particular embodiment, the polyhydric phenol used to prepare the epoxy-containing polymer is Bisphenol A (claim 3; page 6, line 8). The compound containing phosphorus acid groups used to make the reaction product (i) may be selected from phosphonic acids, phosphorous acids, phosphoric acids, including super- and poly-, and mixtures thereof (claim 5; page 7, lines 3-26). The reaction product (i) has reactive functional groups on it that allow the reaction product to cure with the curing agent (page 8, lines 6-10; claim 1). The reaction product (i) has reactive functional groups such as hydroxyl groups, including acidic hydroxyls, or hydroxyl groups and epoxy groups, depending on the equivalent ratio of the compound containing phosphorus acid groups to the epoxy-containing polymer used to prepare the reaction product (claim 7; page 8, lines 6-10). In one embodiment of the invention the equivalent ratio of the compound containing

phosphorus acid groups to epoxy-containing polymer is within the range of 0.5 to 3.5:1 (page 8, lines 1-3; claim 6). In one embodiment of the present invention the molecular weight of the epoxy-containing polymer is 220 to 4500 (claim 4).

The curing agent (ii) is present in the curable coating composition in amounts of 10 to 50 percent by weight of the resinous binder (a) (page 10, lines 26-27; claim 1). In one embodiment of the present invention, the curing agent is selected from aminoplast resins, polyisocyanates, polyacids, organometallic complexed materials, polyamines, and polyamides depending on the identity of the functional groups in the reaction product (page 8, lines 13-17; claim 8). It is most often an aminoplast (claim 9), also commonly called "melamine" because melamine is very often used to prepare aminoplasts. Aminoplasts can be obtained from the condensation reaction of an aldehyde such as formaldehyde with an amine or amide. Nonlimiting examples of amines or amides include melamine, urea and benzoguanamine (page 8, lines 19-20).

In one embodiment of the present invention, the weight percent of the resinous binder (a) in the coating composition, based on the total weight of (a) plus (b), is from 10 to 55 percent (claim 13). The weight percent of the electroconductive pigment (b) in the coating composition, based on the total weight of (a) plus (b), may be from 45 to 90 percent (page 11, lines 11-13; claim 14). The electroconductive pigment (b) is dispersed in the resinous binder (a) such that the weight ratio of the pigment (b) to the resinous binder (a) is within the range of 0.5 to 9.0:1 (page 11, lines 9-11; claim 1). Additionally, when the curable coating composition of the present invention is deposited and cured on a metal substrate, the cured coating is weldable (claim 1; page 11, lines 5-7). By "weldable" is meant that the cured coating is sufficiently electroconductive to sustain a spot welding and joining operation as used in an automotive assembly plant (page 11, lines 7-9).

The electroconductive pigment in the coating composition of the present invention allows the cured coating to be weldable. In one embodiment of the present invention, the electroconductive pigment is selected from zinc,

aluminum, iron, graphite, diiron phosphide, tungsten, stainless steel, and mixtures thereof (claim 10).

The weldable coating compositions of the present invention, which contain phosphorus modified epoxy resins (the reaction product of (i)), demonstrate improved adhesion to substrates compared to weldable coating compositions that contain conventional epoxy resins such as polyglycidyl ethers of polyhydric phenols. Table 1 on pages 25 and 26 in the specification shows a comparison of coating compositions of the present invention compared to coating compositions containing conventional epoxy resins (such as Bonazinc® 3000, a zinc-rich epoxy resin-containing coating, also disclosed in Berger; and Bonazinc® 3001, both of which contain conventional epoxy resins). Note that coating compositions prepared in accordance with the present invention; i. e., containing phosphorus-modified epoxy resins, (Examples 1-5, rows 5-11 of Table 1) demonstrate markedly improved adhesion compared to conventional coating compositions Bonazinc® 3000 and Bonazinc® 3001, without the need for pretreatment (see rows 2 and 4 of Table 1, where the conventional coatings are compared directly to the compositions of the present invention). The presence of phosphorus modified epoxy resins in the curable coating compositions of the present invention is critical to the adhesion (Table 1) and corrosion resistance performance (Table 2) of the invention. The examples further demonstrate the use of phosphorus modified epoxy resins within the claimed ranges of 50 to 90 percent by weight of the resinous binder.

(6) ISSUES

(i) No issues relating to 35 U.S.C. §112, first paragraph.

(ii) No issues relating to 35 U.S.C. §112, second paragraph.

(iii) No issues relating to 35 U.S.C. §102.

(iv) Whether claims 1-10, 13 and 14 are unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference.

(7) GROUPING OF CLAIMS

(i) No issues.

(ii) No issues.

(iii) No issues.

(iv) As to Issue iv, whether claims 1-10, 13 and 14 are unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference, claims 1-10, 13 and 14 stand or fall together.

(8) ARGUMENT

(i) No issue.

(ii) No issue.

(iii) No issue.

(iv) Issue iv, whether claims 1-10, 13 and 14 are unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference.

Claims 1-10, 13 and 14 are rejected as being unpatentable under 35 U.S.C. §103(a) over Berger and Young in view of the Japanese reference. The Office Action dated March 18, 2003, alleges that Berger discloses a weldable coating composition comprising an epoxy-containing material (col. 9, lines 24-26) such as a diglycidyl ether of Bisphenol A (col. 4, lines 10-18) in combination with aminoplasts or isocyanates as curing agents (col. 9, lines 27-28 and 49-58) and electroconductive pigments such as diiron phosphide (col. 8, lines 64-66). The Office Action further alleges that Young discloses a weldable

(col.5, lines 63-64), electroconductive primer coating (col. 7, lines 38-39) comprising an epoxy-containing material (col. 5, lines 8-12) such as Bisphenol A-advanced diglycidyl ethers of Bisphenol A (cols. 15-16, Table IV), a Resimene® or Cymel® aminoplast curing agent (col. 5, lines 45-58 and Table IV) and an electroconductive pigment such as zinc or iron phosphides (col. 6, line 24). The Final Office Action dated July 22, 2003, alleges that Young shows a weldable coating containing from 60-90 weight percent of an epoxy resin and from 10-40 weight percent of a curing agent, indicating that it would have been obvious to employ the epoxy-containing material of Berger within the exemplified amount of from 60-90 percent of Young in order to enhance the adhesion of the coating imparted by the epoxy-containing material.

The Office Actions concede that neither Berger nor Young recite the claimed reaction product of the epoxy resin with a phosphorus acid groups-containing compound (hereinafter also referred to as "phosphorus modified epoxy"). The Final Office Action asserts that the motivation and reasonable expectation of success rests with the Japanese reference, which ascribes "good storage stability and coatability, and forms good coating films with good adhesion, water resistance and fabrication properties" (abstract, Advantage section) to its own disclosed component P1 which includes the phosphorus modified epoxy. The Office Action dated March 18, 2003, alleges that the Japanese reference teaches an epoxy resin modified with phosphoric acid, a curing agent, and a pigment used as a coating for steel plates which are subsequently fabricated into articles, and concludes by alleging that it would have been obvious to one of ordinary skill in the art to modify the epoxy-containing materials of Berger and Young via reaction with the phosphoric acid of the Japanese reference in order to improve storage stability, adhesion, water resistance and fabrication properties.

Appellants respectfully submit that the basis on which the claims were rejected is not a valid rejection under 35 U. S. C. §103(a). First, if the references are considered each in their entirety, there is no motivation to combine the teachings of the Japanese reference with Berger and Young. Secondly, and more significantly, if one were to combine the whole teachings

of Berger and Young with the whole teaching of the Japanese reference, one would not arrive at the present invention as claimed.

References Considered as a Whole Offer No Motivation To Combine

The motivation to modify the prior art must flow from some teaching in the art that suggests the desirability or incentive to make the modification needed to arrive at the claimed invention. See *In re Napier*, 55 F.3d 610, 613, 34 U.S.P.Q.2d 1782, 1784 (Fed. Cir. 1995). Berger and Young disclose weldable coating compositions that may contain epoxy functional resins and aminoplast (melamine) curing agents (Young col. 5, lines 18-62; Berger col. 9, lines 20-58). The epoxy functional resins taught by both references are conventional diglycidyl ethers of polyhydric alcohols. Young demonstrates in Table IV that these conventional epoxy resins may be used in an amount of 60-90 percent by weight, and a curing agent may be used in an amount of 10-40 percent by weight. The Japanese reference discloses a composition prepared by blending a reaction product of an epoxy resin *with phosphoric acid*, a polyester resin containing hydroxyl groups, and an aminoplast (melamine) resin for use as an undercoat for a precoated metal (abstract). First, there is no teaching or suggestion in the Japanese reference that the phosphorus modified epoxy functional resins used therein are suitable for use in weldable coatings. The pigments disclosed in the Japanese reference are conventional, non-electroconductive pigments. Further, it is stated in paragraph [0015] of the Japanese reference: "No specific limitation is placed on the compounding ratio of the modified epoxy resin (A), polyester resin (B) containing hydroxyl groups, and curing agent (C). However, *from the standpoint of adhesive properties and moisture resistance*, the content ratio of the modified epoxy resin (A) is preferably 0.1-20 wt % . . ." (emphasis added). The Office Action alleges that the motivation to modify the epoxy-containing materials of Berger and Young via reaction with the phosphoric acid of the Japanese reference is in order to improve storage stability, adhesion, water resistance and fabrication properties. However, this proposed motivation to

modify the Berger and Young references with the teaching of the Japanese reference to use phosphorus modified epoxy resins is invalid because one skilled in the art would not be led to use the phosphorus modified epoxy resin of the Japanese reference at levels as high as those disclosed by Young in order to improve adhesion or moisture resistance. The Japanese reference explicitly recommends using a phosphorus modified epoxy resin at levels between 0.1 and 20 percent by weight in order to maintain adhesive properties and moisture resistance.

There is absolutely no motivation to modify the compositions of Berger and Young by using the phosphorus modified epoxy resin of the Japanese reference at the epoxy levels taught by Young, which are at least three times the levels disclosed by the Japanese reference for optimum adhesion and moisture resistance of a phosphorus modified epoxy resin. One skilled in the art would not be motivated to improve storage stability, adhesion, water resistance and fabrication properties of the Berger and Young compositions by using the phosphorus modified epoxy of the Japanese reference at the levels taught by Young.

References Considered as a Whole Teach Away from Invention

If one were to combine the whole teachings of Berger and Young with the whole teaching of the Japanese reference, one would not arrive at the present invention as claimed; i. e., a curable coating composition comprising:

- (a) a resinous binder comprising:
 - (i) a reaction product of an epoxy-containing polymer with a compound containing phosphorus acid groups, the reaction product being present in the composition in amounts of 50 to 90 percent by weight of the resinous binder and having reactive functional groups, and
 - (ii) a curing agent having functional groups reactive with the functional groups of (i), the curing agent being present in the composition in amounts of 10 to 50 percent by weight of the resinous binder; and
- (b) an electroconductive pigment dispersed in (a) such that the weight ratio of b to (i) plus (ii) is within the range of 0.5 to 9.0:1, the curable coating

composition being characterized such that when it is deposited and cured on a metal substrate, the cured coating is weldable.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 353 F.2d 238, 241, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965). See also MPEP §2141.02: "[a] prior art reference must be considered in its entirety, i. e., as a whole, including portions that would lead away from the claimed invention." If the references are considered each in their entirety, the teachings of the Japanese reference combined with Berger and Young teach away from the present invention. As mentioned earlier, Berger and Young disclose weldable coating compositions that may contain conventional epoxy functional resins and aminoplast (melamine) curing agents. Young demonstrates in Table IV that the conventional epoxy resin may be used in an amount of 60-90 percent by weight, and a curing agent may be used in an amount of 10-40 percent by weight. The Japanese reference discloses other coating compositions prepared by blending a reaction product of an epoxy resin with phosphoric acid, a polyester resin containing hydroxyl groups, and an aminoplast (melamine) resin for use as an undercoat for a precoated metal. The Japanese reference indicates that the phosphorus modified epoxy resin is preferably used in an amount of 0.1 to 20 percent by weight when considering adhesive properties and moisture resistance. No other quantitative range is disclosed by the Japanese reference. While the range of 60-90 percent by weight is taught by Young to be suitable for a conventional epoxy resin in a weldable coating composition, there is no teaching or suggestion in any of the references, taken alone or in any combination, that such a high range is suitable for a phosphorus modified epoxy resin in a weldable coating or any other coating. If one were to combine all the references after considering them in their entirety, in order to prepare a weldable coating composition comprising a phosphorus modified epoxy resin and a curing agent, one skilled in the art would be compelled to use the phosphorus modified epoxy resin taught by the

Japanese reference at the low levels taught by the Japanese reference, in order to avoid the risk of compromised adhesion or moisture resistance. The Japanese reference explicitly teaches the use of phosphorus modified epoxy resins at levels of 0.1 to 20 percent by weight in order to maintain adhesion and moisture resistance properties.

CONCLUSION

Appellants have shown that if the references are considered each in their entirety, there is no motivation to combine the teachings of the Japanese reference with Berger and Young in order to arrive at the present invention. Appellants have further shown that if one were to combine the whole teachings of Berger and Young with the whole teaching of the Japanese reference, one would not arrive at the present invention as claimed.

Based on the above, Appellants respectfully request that the Board reverse the Examiner on the rejection of claims 1-10, 13 and 14 as unpatentable under 35 U.S.C. 103(a) over Berger and Young in view of the Japanese reference and allow claims 1-10, 13 and 14.

Respectfully submitted,

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Appendix
THE CLAIMS ON APPEAL

1. (Once amended) A curable coating composition comprising
 - a. a resinous binder comprising:
 - i. a reaction product of an epoxy-containing polymer with a compound containing phosphorus acid groups, the reaction product being present in the composition in amounts of 50 to 90 percent by weight of the resinous binder and having reactive functional groups, and
 - ii. a curing agent having functional groups reactive with the functional groups of (i), the curing agent being present in the composition in amounts of 10 to 50 percent by weight of the resinous binder; and
 - b. an electroconductive pigment dispersed in (a) such that the weight ratio of b to (i) plus (ii) is within the range of 0.5 to 9.0:1,
- the curable coating composition being characterized such that when it is deposited and cured on a metal substrate, the cured coating is weldable.

2. (Original) The curable coating composition according to claim 1 in which the epoxy-containing polymer is a polyglycidyl ether of a polyhydric phenol.

3. (Original) The curable coating composition according to claim 2 where the polyhydric phenol is Bisphenol A.

4. (Original) The curable coating composition according to claim 1 wherein the molecular weight of the epoxy-containing polymer is 220-4500 based on epoxy equivalent multiplied by the epoxy functionality.

5. (Original) The curable coating composition according to claim 1 wherein the compound containing phosphorus acid groups is selected from the group comprising phosphoric acid, a phosphonic acid, and phosphorous acid.

6. (Original) The curable coating composition according to claim 1 wherein the equivalent ratio of the compound containing phosphorus acid groups to epoxy-containing polymer is within the range of 0.5 to 3.5:1.

7. (Original) The curable coating composition according to claim 1 wherein the functional groups of (i) are hydroxyl groups or hydroxyl and epoxy groups.

8. (Original) The curable coating composition according to claim 1 wherein the curing agent is selected from the group comprising aminoplast resins, polyisocyanates, polyacids, organometallic complexed materials, polyamines, and polyamides.

9. (Original) The curable coating composition according to claim 8 wherein the curing agent is an aminoplast.

10. (Original) The curable coating composition according to claim 1 wherein said electroconductive pigment is selected from the group comprising zinc, aluminum, iron, graphite, diiron phosphide, tungsten, stainless steel, and mixtures thereof.

13. (Original) The curable coating composition according to claim 1 wherein the weight percent of (a) based on the total weight of (a) plus (b) is from 10 to 55 percent.

14. (Original) The curable coating composition according to claim 1 wherein the weight percent of (b) based on the total weight of (a) plus (b) is from 45 to 90 percent.